#5

SEQUENCE LISTING

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<120> MULTIFUNCTIONAL PROTEASE INHIBITORS AND THEIR USE IN TREATMENT OF DISEASE

<130> 368292000200

<140> U.S. 10/025,514
<141> 2001-12-18

<150> U.S. 60/256,699
<151> 2000-12-18

<150> U.S. 60/331,966
<151> 2001-11-20

<160> 33

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 1182
<212> DNA
<213> Homo sapiens

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ttagctcatc aaagtaattc tactaacatt ttttttagtc ctgtttctat tgccactgct 180
ttcgccatgt tgagtttagg tactaaagcc gatacccatg acgagatttt agaaggttta 240
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agaactttga atcaacctga ttctcaattg caattaacta ctggtaacgg tttatttttg 360
tctgaaggtt taaaattggt tgacaaattc ctagaagacg tcaagaaact atatcatagt 420
gaggctttta ccgttaattt tggtgatact gaggaagcta aaaagcaaat taatgattat 480
gttgagaaag gcacccaggg taagatcgtt gacctagtta aagaattaga tcgtgatacc 540
gtcttcgcac tagttaacta tatttttttc aagggtaagt gggaacgtcc tttcgaggtt 600
aaagatactg aagaggaaga ttttcatgtt gatcaagtta ctactgtcaa agttccaatg 660
atgaaaagac tgggtatgtt caatattcaa cattgcaaaa aattaagttc ttgggtctta 720
ttaatgaagt atttaggtaa cgctactgct attttttttt taccagacga aggtaagctt 780
caacatttag agaatgagtt gactcatgac attattacta aatttttaga gaacgaggat 840
cgtcgtagcg cttctctgca cctgccaaag ttaagtatca ccggtactta cgacttaaaa 900
tctgttttag gccagttagg tattaccaaa gtttttttcta acggtgccga tttgagtggt 960
gttactgaag aagctccatt aaaattgagt aaagctgttc acaaagccgt cttaactatt 1020
gatgaaaagg gtaccgaggc cgccggcgct atgttcctgg aagctattcc aatgagcatt 1080
ccaccagaag ttaaatttaa taaaccattc gtttttctga tgatcgagca gaacactaaa 1140
agcccattgt ttatgggtaa ggttgtcaac ccaactcaga ag 1182

<210> 2
<211> 394
<212> PRT
<213> Homo sapiens

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Asp Gln Asp His Pro Thr Phe Asn Lys Ile Thr Pro Asn Leu Ala Glu
            20   25   30
Phe Ala Phe Ser Leu Tyr Arg Gln Leu Ala His Gln Ser Asn Ser Thr
        35   40   45
Asn Ile Phe Phe Ser Pro Val Ser Ile Ala Thr Ala Phe Ala Met Leu
    50   55   60
Ser Leu Gly Thr Lys Ala Asp Thr His Asp Glu Ile Leu Glu Gly Leu
65   70   75   80
Asn Phe Asn Leu Thr Glu Ile Pro Glu Ala Gln Ile His Glu Gly Phe
                85   90   95
Gln Glu Leu Leu Arg Thr Leu Asn Gln Pro Asp Ser Gln Leu Gln Leu
            100   105   110
Thr Thr Gly Asn Gly Leu Phe Leu Ser Glu Gly Leu Lys Leu Val Asp
        115   120   125
Lys Phe Leu Glu Asp Val Lys Lys Leu Tyr His Ser Glu Ala Phe Thr
    130   135   140
Val Asn Phe Gly Asp Thr Glu Glu Ala Lys Lys Gln Ile Asn Asp Tyr
145   150   155   160
Val Glu Lys Gly Thr Gln Gly Lys Ile Val Asp Leu Val Lys Glu Leu
                165   170   175
Asp Arg Asp Thr Val Phe Ala Leu Val Asn Tyr Ile Phe Phe Lys Gly
            180   185   190
Lys Trp Glu Arg Pro Phe Glu Val Lys Asp Thr Glu Glu Glu Asp Phe
        195   200   205
His Val Asp Gln Val Thr Thr Val Lys Val Pro Met Met Lys Arg Leu
    210   215   220
Gly Met Phe Asn Ile Gln His Cys Lys Lys Leu Ser Ser Trp Val Leu
225   230   235   240
Leu Met Lys Tyr Leu Gly Asn Ala Thr Ala Ile Phe Phe Leu Pro Asp
                245   250   255
Glu Gly Lys Leu Gln His Leu Glu Asn Glu Leu Thr His Asp Ile Ile
            260   265   270
Thr Lys Phe Leu Glu Asn Glu Asp Arg Arg Ser Ala Ser Leu His Leu
        275   280   285
Pro Lys Leu Ser Ile Thr Gly Thr Tyr Asp Leu Lys Ser Val Leu Gly
    290   295   300
Gln Leu Gly Ile Thr Lys Val Phe Ser Asn Gly Ala Asp Leu Ser Gly
305   310   315   320
Val Thr Glu Glu Ala Pro Leu Lys Leu Ser Lys Ala Val His Lys Ala
                325   330   335
Val Leu Thr Ile Asp Glu Lys Gly Thr Glu Ala Ala Gly Ala Met Phe
            340   345   350
Leu Glu Ala Ile Pro Met Ser Ile Pro Pro Glu Val Lys Phe Asn Lys
        355   360   365
Pro Phe Val Phe Leu Met Ile Glu Gln Asn Thr Lys Ser Pro Leu Phe
    370   375   380
Met Gly Lys Val Val Asn Pro Thr Gln Lys
385   390

<210> 3
<211> 321
<212> DNA
<213> Homo sapiens

<400> 3
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tacaagaagc cagaatgtca atccgactgg caatgtccag gtaagaagag atgttgtcca 120
gacacttgtg gtatcaagtg tctagaccca gttgacaccc caaacccaac tagaagaaag 180
ccaggtaagt gtccagttac ttacggtcaa tgtttgatgt tgaacccacc aaacttctgt 240
gaaatggacg gtcaatgtaa gagagacttg aagtgttgta tgggtatgtg tggtaagtcc 300
tgtgtttccc cagtcaaggc c 321

<210> 4
<211> 107
<212> PRT
<213> Homo sapiens

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1 5 10 15
Gln Cys Leu Arg Tyr Lys Lys Pro Glu Cys Gln Ser Asp Trp Gln Cys
20 25 30
Pro Gly Lys Lys Arg Cys Cys Pro Asp Thr Cys Gly Ile Lys Cys Leu
35 40 45
Asp Pro Val Asp Thr Pro Asn Pro Thr Arg Arg Lys Pro Gly Lys Cys
50 55 60
Pro Val Thr Tyr Gly Gln Cys Leu Met Leu Asn Pro Pro Asn Phe Cys
65 70 75 80
Glu Met Asp Gly Gln Cys Lys Arg Asp Leu Lys Cys Cys Met Gly Met
85 90 95
Cys Gly Lys Ser Cys Val Ser Pro Val Lys Ala
100 105

<210> 5
<211> 552
<212> DNA
<213> Homo sapiens

<400> 5
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gccaagttcg tggggacacc agaagtcaac cagaccacct tataccagcg ttatgagatc 120
aagatgacca agatgtataa agggttccaa gccttagggg atgccgctga catccggttc 180
gtctacaccc ccgccatgga gagtgtctgc ggatacttcc acaggtccca caaccgcagc 240
gaggagtttc tcattgctgg aaaactgcag gatggactct tgcacatcac tacctgcagt 300
ttcgtggctc cctggaacag cctgagctta gctcagcgcc ggggcttcac caagacctac 360
actgttggct gtgaggaatg cacagtgttt ccctgtttat ccatcccctg caaactgcag 420
agtggcactc attgcttgtg gacggaccag ctcctccaag gctctgaaaa gggcttccag 480
tcccgtcacc ttgcctgcct gcctcgggag ccagggctgt gcacctggca gtccctgcgg 540
tcccagatag cc 552

<210> 6
<211> 184
<212> PRT
<213> Homo sapiens

<400> 6
Cys Thr Cys Val Pro Pro His Pro Gln Thr Ala Phe Cys Asn Ser Asp
1 5 10 15
Leu Val Ile Arg Ala Lys Phe Val Gly Thr Pro Glu Val Asn Gln Thr
20 25 30
Thr Leu Tyr Gln Arg Tyr Glu Ile Lys Met Thr Lys Met Tyr Lys Gly

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        35                  40                  45
Phe Gln Ala Leu Gly Asp Ala Ala Asp Ile Arg Phe Val Tyr Thr Pro
    50                  55                  60
Ala Met Glu Ser Val Cys Gly Tyr Phe His Arg Ser His Asn Arg Ser
65                  70                  75                  80
Glu Glu Phe Leu Ile Ala Gly Lys Leu Gln Asp Gly Leu Leu His Ile
                85                  90                  95
Thr Thr Cys Ser Phe Val Ala Pro Trp Asn Ser Leu Ser Leu Ala Gln
            100                 105                 110
Arg Arg Gly Phe Thr Lys Thr Tyr Thr Val Gly Cys Glu Glu Cys Thr
        115                 120                 125
Val Phe Pro Cys Leu Ser Ile Pro Cys Lys Leu Gln Ser Gly Thr His
    130                 135                 140
Cys Leu Trp Thr Asp Gln Leu Leu Gln Gly Ser Glu Lys Gly Phe Gln
145                 150                 155                 160
Ser Arg His Leu Ala Cys Leu Pro Arg Glu Pro Gly Leu Cys Thr Trp
                165                 170                 175
Gln Ser Leu Arg Ser Gln Ile Ala
            180
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<210> 7
<211> 1525
<212> DNA
<213> Homo sapiens

<400> 7

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aatgtttgag atacaagaag ccagaatgtc aatccgactg gcaatgtcca ggtaagaaga     120
gatgttgtcc agacacttgt ggtatcaagt gtctagaccc agttgacacc ccaaacccaa     180
ctagaagaaa gccaggtaag tgtccagtta cttacggtca atgtttgatg ttgaacccac     240
caaacttctg tgaaatggac ggtcaatgta agagagactt gaagtgttgt atgggtatgt     300
gtggtaagtc ctgtgtttcc ccagtcaagg ccatggaaga ccctcaaggc gacgccgctc     360
aaaaaaccga caccagtcat cacgaccaag accatccgac ttttaataaa attactccaa     420
atttagccga atttgctttt tctttgtata gacaattagc tcatcaaagt aattctacta     480
acatttttt tagtcctgtt tctattgcca ctgctttcgc catgttgagt ttaggtacta     540
aagccgatac ccatgacgag attttagaag gtttaaactt taatttgacc gaaatcccag     600
aagcccaaat tcacgagggt tttcaagagt tgttgagaac tttgaatcaa cctgattctc     660
aattgcaatt aactactggt aacggtttat ttttgtctga aggtttaaaa ttggttgaca     720
aattcctaga agacgtcaag aaactatatc atagtgaggc ttttaccgtt aattttggtg     780
atactgagga agctaaaaag caaattaatg attatgttga gaaaggcacc cagggtaaga     840
tcgttgacct agttaaagaa ttagatcgtg ataccgtctt cgcactagtt aactatattt     900
ttttcaaggg taagtgggaa cgtccttttcg aggttaaaga tactgaagag gaagattttc     960
atgttgatca agttactact gtcaaagttc caatgatgaa aagactgggt atgttcaata    1020
ttcaacattg caaaaaatta agttcttggg tcttattaat gaagtattta ggtaacgcta    1080
ctgctatttt ttttttacca gacgaaggta agcttcaaca tttagagaat gagttgactc    1140
atgacattat tactaaattt ttagagaacg aggatcgtcg tagcgcttct ctgcacctgc    1200
caaagttaag tatcaccggt acttacgact taaaatctgt tttaggccag ttaggtatta    1260
ccaaagtttt ttctaacggt gccgatttga gtggtgttac tgaagaagct ccattaaaat    1320
tgagtaaagc tgttcacaaa gccgtcttaa ctattgatga aaagggtacc gaggccgccg    1380
gcgctatgtt cctggaagct attccaatga gcattccacc agaagttaaa tttaataaac    1440
cattcgtttt tctgatgatc gagcagaaca ctaaaagccc attgtttatg ggtaaggttg    1500
tcaacccaac tcagaagtag tcgac                                          1525
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<210> 8
<211> 503
<212> PRT
<213> Homo sapiens

<400> 8

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            20                  25                  30
Cys Pro Gly Lys Lys Arg Cys Cys Pro Asp Thr Cys Gly Ile Lys Cys
        35                  40                  45
Leu Asp Pro Val Asp Thr Pro Asn Pro Thr Arg Arg Lys Pro Gly Lys
    50                  55                  60
Cys Pro Val Thr Tyr Gly Gln Cys Leu Met Leu Asn Pro Pro Asn Phe
65                  70                  75                  80
Cys Glu Met Asp Gly Gln Cys Lys Arg Asp Leu Lys Cys Cys Met Gly
                85                  90                  95
Met Cys Gly Lys Ser Cys Val Ser Pro Val Lys Ala Met Glu Asp Pro
            100                 105                 110
Gln Gly Asp Ala Ala Gln Lys Thr Asp Thr Ser His His Asp Gln Asp
        115                 120                 125
His Pro Thr Phe Asn Lys Ile Thr Pro Asn Leu Ala Glu Phe Ala Phe
    130                 135                 140
Ser Leu Tyr Arg Gln Leu Ala His Gln Ser Asn Ser Thr Asn Ile Phe
145                 150                 155                 160
Phe Ser Pro Val Ser Ile Ala Thr Ala Phe Ala Met Leu Ser Leu Gly
                165                 170                 175
Thr Lys Ala Asp Thr His Asp Glu Ile Leu Glu Gly Leu Asn Phe Asn
            180                 185                 190
Leu Thr Glu Ile Pro Glu Ala Gln Ile His Glu Gly Phe Gln Glu Leu
        195                 200                 205
Leu Arg Thr Leu Asn Gln Pro Asp Ser Gln Leu Gln Leu Thr Thr Gly
    210                 215                 220
Asn Gly Leu Phe Leu Ser Glu Gly Leu Lys Leu Val Asp Lys Phe Leu
225                 230                 235                 240
Glu Asp Val Lys Lys Leu Tyr His Ser Glu Ala Phe Thr Val Asn Phe
                245                 250                 255
Gly Asp Thr Glu Glu Ala Lys Lys Gln Ile Asn Asp Tyr Val Glu Lys
            260                 265                 270
Gly Thr Gln Gly Lys Ile Val Asp Leu Val Lys Glu Leu Asp Arg Asp
        275                 280                 285
Thr Val Phe Ala Leu Val Asn Tyr Ile Phe Phe Lys Gly Lys Trp Glu
    290                 295                 300
Arg Pro Phe Glu Val Lys Asp Thr Glu Glu Glu Asp Phe His Val Asp
305                 310                 315                 320
Gln Val Thr Thr Val Lys Val Pro Met Met Lys Arg Leu Gly Met Phe
                325                 330                 335
Asn Ile Gln His Cys Lys Lys Leu Ser Ser Trp Val Leu Leu Met Lys
            340                 345                 350
Tyr Leu Gly Asn Ala Thr Ala Ile Phe Phe Leu Pro Asp Glu Gly Lys
        355                 360                 365
Leu Gln His Leu Glu Asn Glu Leu Thr His Asp Ile Ile Thr Lys Phe
    370                 375                 380
Leu Glu Asn Glu Asp Arg Arg Ser Ala Ser Leu His Leu Pro Lys Leu
385                 390                 395                 400
Ser Ile Thr Gly Thr Tyr Asp Leu Lys Ser Val Leu Gly Gln Leu Gly
                405                 410                 415
Ile Thr Lys Val Phe Ser Asn Gly Ala Asp Leu Ser Gly Val Thr Glu
            420                 425                 430
Glu Ala Pro Leu Lys Leu Ser Lys Ala Val His Lys Ala Val Leu Thr
```

```
        435                 440                 445
Ile Asp Glu Lys Gly Thr Glu Ala Ala Gly Ala Met Phe Leu Glu Ala
    450                 455                 460
Ile Pro Met Ser Ile Pro Pro Glu Val Lys Phe Asn Lys Pro Phe Val
465                 470                 475                 480
Phe Leu Met Ile Glu Gln Asn Thr Lys Ser Pro Leu Phe Met Gly Lys
                485                 490                 495
Val Val Asn Pro Thr Gln Lys
            500
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<210> 9
<211> 1756
<212> DNA
<213> Homo sapiens

<400> 9

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gttatgagat caagatgacc aagatgtata aagggttcca agccttaggg gatgccgctg     180
acatccggtt cgtctacacc cccgccatgg agagtgtctg cggatacttc cacaggtccc     240
acaaccgcag cgaggagttt ctcattgctg gaaaactgca ggatggactc ttgcacatca     300
ctacctgcag tttcgtggct ccctggaaca gcctgagctt agctcagcgc cggggcttca     360
ccaagaccta cactgttggc tgtgaggaat gcacagtgtt tccctgttta tccatccct      420
gcaaactgca gagtggcact cattgcttgt ggacggacca gctcctccaa ggctctgaaa     480
agggcttcca gtcccgtcac cttgcctgcc tgcctcggga gccagggctg tgcacctggc     540
agtccctgcg gtcccagata gccatggaag accctcaagg cgacgccgct caaaaaaccg     600
acaccagtca tcacgaccaa gaccatccga cttttaataa aattactcca aatttagccg     660
aatttgcttt ttctttgtat agacaattag ctcatcaaag taattctact aacatttttt     720
ttagtcctgt ttctattgcc actgctttcg ccatgttgag tttaggtact aaagccgata     780
cccatgacga gattttagaa ggtttaaact ttaatttgac cgaaatccca gaagcccaaa     840
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taactactgg taacggttta tttttgtctg aaggtttaaa attggttgac aaattcctag     960
aagacgtcaa gaaactatat catagtgagg cttttaccgt taattttggt gatactgagg    1020
aagctaaaaa gcaaattaat gattatgttg agaaaggcac ccagggtaag atcgttgacc    1080
tagttaaaga attagatcgt gataccgtct tcgcactagt taactatatt tttttcaagg    1140
gtaagtggga acgtcctttc gaggttaaag atactgaaga ggaagatttt catgttgatc    1200
aagttactac tgtcaaagtt ccaatgatga aaagactggg tatgttcaat attcaacatt    1260
gcaaaaaatt aagttcttgg gtcttattaa tgaagtattt aggtaacgct actgctattt    1320
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tttctaacgg tgccgatttg agtggtgtta ctgaagaagc tccattaaaa ttgagtaaag    1560
ctgttcacaa agccgtctta actattgatg aaaagggtac cgaggccgcc ggcgctatgt    1620
tcctggaagc tattccaatg agcattccac cagaagttaa atttaataaa ccattcgttt    1680
ttctgatgat cgagcagaac actaaaagcc cattgtttat gggtaaggtt gtcaacccaa    1740
ctcagaagta gtcgac                                                    1756
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<210> 10
<211> 580
<212> PRT
<213> Homo sapiens

<400> 10

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Met Cys Thr Cys Val Pro Pro His Pro Gln Thr Ala Phe Cys Asn Ser
 1               5                  10                  15
Asp Leu Val Ile Arg Ala Lys Phe Val Gly Thr Pro Glu Val Asn Gln
            20                  25                  30
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Thr Thr Leu Tyr Gln Arg Tyr Glu Ile Lys Met Thr Lys Met Tyr Lys
35 40 45
Gly Phe Gln Ala Leu Gly Asp Ala Ala Asp Ile Arg Phe Val Tyr Thr
50 55 60
Pro Ala Met Glu Ser Val Cys Gly Tyr Phe His Arg Ser His Asn Arg
65 70 75 80
Ser Glu Glu Phe Leu Ile Ala Gly Lys Leu Gln Asp Gly Leu Leu His
85 90 95
Ile Thr Thr Cys Ser Phe Val Ala Pro Trp Asn Ser Leu Ser Leu Ala
100 105 110
Gln Arg Arg Gly Phe Thr Lys Thr Tyr Thr Val Gly Cys Glu Glu Cys
115 120 125
Thr Val Phe Pro Cys Leu Ser Ile Pro Cys Lys Leu Gln Ser Gly Thr
130 135 140
His Cys Leu Trp Thr Asp Gln Leu Leu Gln Gly Ser Glu Lys Gly Phe
145 150 155 160
Gln Ser Arg His Leu Ala Cys Leu Pro Arg Glu Pro Gly Leu Cys Thr
165 170 175
Trp Gln Ser Leu Arg Ser Gln Ile Ala Met Glu Asp Pro Gln Gly Asp
180 185 190
Ala Ala Gln Lys Thr Asp Thr Ser His His Asp Gln Asp His Pro Thr
195 200 205
Phe Asn Lys Ile Thr Pro Asn Leu Ala Glu Phe Ala Phe Ser Leu Tyr
210 215 220
Arg Gln Leu Ala His Gln Ser Asn Ser Thr Asn Ile Phe Phe Ser Pro
225 230 235 240
Val Ser Ile Ala Thr Ala Phe Ala Met Leu Ser Leu Gly Thr Lys Ala
245 250 255
Asp Thr His Asp Glu Ile Leu Glu Gly Leu Asn Phe Asn Leu Thr Glu
260 265 270
Ile Pro Glu Ala Gln Ile His Glu Gly Phe Gln Glu Leu Leu Arg Thr
275 280 285
Leu Asn Gln Pro Asp Ser Gln Leu Gln Leu Thr Thr Gly Asn Gly Leu
290 295 300
Phe Leu Ser Glu Gly Leu Lys Leu Val Asp Lys Phe Leu Glu Asp Val
305 310 315 320
Lys Lys Leu Tyr His Ser Glu Ala Phe Thr Val Asn Phe Gly Asp Thr
325 330 335
Glu Glu Ala Lys Lys Gln Ile Asn Asp Tyr Val Glu Lys Gly Thr Gln
340 345 350
Gly Lys Ile Val Asp Leu Val Lys Glu Leu Asp Arg Asp Thr Val Phe
355 360 365
Ala Leu Val Asn Tyr Ile Phe Phe Lys Gly Lys Trp Glu Arg Pro Phe
370 375 380
Glu Val Lys Asp Thr Glu Glu Glu Asp Phe His Val Asp Gln Val Thr
385 390 395 400
Thr Val Lys Val Pro Met Met Lys Arg Leu Gly Met Phe Asn Ile Gln
405 410 415
His Cys Lys Lys Leu Ser Ser Trp Val Leu Leu Met Lys Tyr Leu Gly
420 425 430
Asn Ala Thr Ala Ile Phe Phe Leu Pro Asp Glu Gly Lys Leu Gln His
435 440 445
Leu Glu Asn Glu Leu Thr His Asp Ile Ile Thr Lys Phe Leu Glu Asn
450 455 460
Glu Asp Arg Arg Ser Ala Ser Leu His Leu Pro Lys Leu Ser Ile Thr
465 470 475 480
Gly Thr Tyr Asp Leu Lys Ser Val Leu Gly Gln Leu Gly Ile Thr Lys

```
                485                 490                 495
Val Phe Ser Asn Gly Ala Asp Leu Ser Gly Val Thr Glu Glu Ala Pro
            500                 505                 510
Leu Lys Leu Ser Lys Ala Val His Lys Ala Val Leu Thr Ile Asp Glu
        515                 520                 525
Lys Gly Thr Glu Ala Ala Gly Ala Met Phe Leu Glu Ala Ile Pro Met
    530                 535                 540
Ser Ile Pro Pro Glu Val Lys Phe Asn Lys Pro Phe Val Phe Leu Met
545                 550                 555                 560
Ile Glu Gln Asn Thr Lys Ser Pro Leu Phe Met Gly Lys Val Val Asn
                565                 570                 575
Pro Thr Gln Lys
            580

<210> 11
<211> 5
<212> PRT
<213> Homo sapiens

<400> 11
Gln Val Val Ala Gly
 1               5

<210> 12
<211> 5
<212> PRT
<213> Bacteria (streptomyces)

<220>
<221> MOD_RES
<222> 1
<223> Xaa= valine modified with N-terminal isovaleryl
      group

<221> MOD_RES
<222> 3, 5
<223> Xaa= statin

<400> 12
Xaa Val Xaa Ala Xaa
 1               5

<210> 13
<211> 1582
<212> DNA
<213> Homo sapiens

<400> 13
tctagaccat gtgcacctgt gtcccacccc acccacagac ggccttctgc aattccgacc      60
tcgtcatcag ggccaagttc gtggggacac cagaagtcaa ccagaccacc ttataccagc     120
gttatgagat caagatgacc aagatgtata aagggttcca agccttaggg gatgccgctg     180
acatccggtt cgtctacacc cccgccatgg agagtgtctg cggatacttc cacaggtccc     240
acaaccgcag cgaggagttt ctcattgctg gaaaactgca ggatggactc ttgcacatca     300
ctacctgcag tttcgtggct ccctggaaca gcctgagctt agctcagcgc cggggcttca     360
ccaagacgta tactgttggc tgtgaggaaa tggaagaccc tcaaggcgac gccgctcaaa     420
aaaccgacac cagtcatcac gaccaagacc atccgacttt taataaaatt actccaaatt     480
tagccgaatt tgctttttct ttgtatagac aattagctca tcaaagtaat tctactaaca     540
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ttttttttag tcctgtttct attgccactg ctttcgccat gttgagttta ggtactaaag     600
ccgataccca tgacgagatt ttagaaggtt taaactttaa tttgaccgaa atcccagaag     660
cccaaattca cgagggtttt caagagttgt tgagaacttt gaatcaacct gattctcaat     720
tgcaattaac tactggtaac ggtttatttt tgtctgaagg tttaaaattg gttgacaaat     780
tcctagaaga cgtcaagaaa ctatatcata gtgaggcttt taccgttaat tttggtgata     840
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ttgatcaagt tactactgtc aaagttccaa tgatgaaaag actgggtatg ttcaatattc    1080
aacattgcaa aaaattaagt tcttgggtct tattaatgaa gtatttaggt aacgctactg    1140
ctatttttt tttaccagac gaaggtaagc ttcaacattt agagaatgag ttgactcatg    1200
acattattac taaattttta gagaacgagg atcgtcgtag cgcttctctg cacctgccaa    1260
agttaagtat caccggtact tacgacttaa aatctgtttt aggccagtta ggtattacca    1320
aagttttttc taacggtgcc gatttgagtg gtgttactga agaagctcca ttaaaattga    1380
gtaaagctgt tcacaaagcc gtcttaacta ttgatgaaaa gggtaccgag gccgccggcg    1440
ctatgttcct ggaagctatt ccaatgagca ttccaccaga agttaaattt aataaaccat    1500
tcgtttttct gatgatcgag cagaacacta aaagcccatt gtttatgggt aaggttgtca    1560
acccaactca gaagtagtcg ac                                            1582
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<210> 14
<211> 522
<212> PRT
<213> Homo sapiens

<400> 14

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Met Cys Thr Cys Val Pro Pro His Pro Gln Thr Ala Phe Cys Asn Ser
 1               5                  10                  15
Asp Leu Val Ile Arg Ala Lys Phe Val Gly Thr Pro Glu Val Asn Gln
            20                  25                  30
Thr Thr Leu Tyr Gln Arg Tyr Glu Ile Lys Met Thr Lys Met Tyr Lys
        35                  40                  45
Gly Phe Gln Ala Leu Gly Asp Ala Ala Asp Ile Arg Phe Val Tyr Thr
    50                  55                  60
Pro Ala Met Glu Ser Val Cys Gly Tyr Phe His Arg Ser His Asn Arg
65                  70                  75                  80
Ser Glu Glu Phe Leu Ile Ala Gly Lys Leu Gln Asp Gly Leu Leu His
                85                  90                  95
Ile Thr Thr Cys Ser Phe Val Ala Pro Trp Asn Ser Leu Ser Leu Ala
            100                 105                 110
Gln Arg Arg Gly Phe Thr Lys Thr Tyr Thr Val Gly Cys Glu Glu Met
        115                 120                 125
Glu Asp Pro Gln Gly Asp Ala Ala Gln Lys Thr Asp Thr Ser His His
    130                 135                 140
Asp Gln Asp His Pro Thr Phe Asn Lys Ile Thr Pro Asn Leu Ala Glu
145                 150                 155                 160
Phe Ala Phe Ser Leu Tyr Arg Gln Leu Ala His Gln Ser Asn Ser Thr
                165                 170                 175
Asn Ile Phe Phe Ser Pro Val Ser Ile Ala Thr Ala Phe Ala Met Leu
            180                 185                 190
Ser Leu Gly Thr Lys Ala Asp Thr His Asp Glu Ile Leu Glu Gly Leu
        195                 200                 205
Asn Phe Asn Leu Thr Glu Ile Pro Glu Ala Gln Ile His Glu Gly Phe
    210                 215                 220
Gln Glu Leu Leu Arg Thr Leu Asn Gln Pro Asp Ser Gln Leu Gln Leu
225                 230                 235                 240
Thr Thr Gly Asn Gly Leu Phe Leu Ser Glu Gly Leu Lys Leu Val Asp
                245                 250                 255
```

```
Lys Phe Leu Glu Asp Val Lys Lys Leu Tyr His Ser Glu Ala Phe Thr
            260                 265                 270
Val Asn Phe Gly Asp Thr Glu Glu Ala Lys Lys Gln Ile Asn Asp Tyr
        275                 280                 285
Val Glu Lys Gly Thr Gln Gly Lys Ile Val Asp Leu Val Lys Glu Leu
    290                 295                 300
Asp Arg Asp Thr Val Phe Ala Leu Val Asn Tyr Ile Phe Phe Lys Gly
305                 310                 315                 320
Lys Trp Glu Arg Pro Phe Glu Val Lys Asp Thr Glu Glu Glu Asp Phe
                325                 330                 335
His Val Asp Gln Val Thr Thr Val Lys Val Pro Met Met Lys Arg Leu
            340                 345                 350
Gly Met Phe Asn Ile Gln His Cys Lys Lys Leu Ser Ser Trp Val Leu
        355                 360                 365
Leu Met Lys Tyr Leu Gly Asn Ala Thr Ala Ile Phe Phe Leu Pro Asp
    370                 375                 380
Glu Gly Lys Leu Gln His Leu Glu Asn Glu Leu Thr His Asp Ile Ile
385                 390                 395                 400
Thr Lys Phe Leu Glu Asn Glu Asp Arg Arg Ser Ala Ser Leu His Leu
                405                 410                 415
Pro Lys Leu Ser Ile Thr Gly Thr Tyr Asp Leu Lys Ser Val Leu Gly
            420                 425                 430
Gln Leu Gly Ile Thr Lys Val Phe Ser Asn Gly Ala Asp Leu Ser Gly
        435                 440                 445
Val Thr Glu Glu Ala Pro Leu Lys Leu Ser Lys Ala Val His Lys Ala
    450                 455                 460
Val Leu Thr Ile Asp Glu Lys Gly Thr Glu Ala Ala Gly Ala Met Phe
465                 470                 475                 480
Leu Glu Ala Ile Pro Met Ser Ile Pro Pro Glu Val Lys Phe Asn Lys
                485                 490                 495
Pro Phe Val Phe Leu Met Ile Glu Gln Asn Thr Lys Ser Pro Leu Phe
            500                 505                 510
Met Gly Lys Val Val Asn Pro Thr Gln Lys
        515                 520
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<210> 15
<211> 1525
<212> DNA
<213> Homo sapiens

<400> 15
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tctagaccat ggaagaccct caaggcgacg ccgctcaaaa aaccgacacc agtcatcacg      60
accaagacca tccgactttt aataaaatta ctccaaattt agccgaattt gctttttctt     120
tgtatagaca attagctcat caaagtaatt ctactaacat ttttttttagt cctgtttcta     180
ttgccactgc tttcgccatg ttgagtttag gtactaaagc cgatacccat gacgagattt     240
tagaaggttt aaactttaat ttgaccgaaa tcccagaagc ccaaattcac gagggttttc     300
aagagttgtt gagaactttg aatcaacctg attctcaatt gcaattaact actggtaacg     360
gtttatttttt gtctgaaggt ttaaaattgg ttgacaaatt cctagaagac gtcaagaaac     420
tatatcatag tgaggctttt accgttaatt ttggtgatac tgaggaagct aaaaagcaaa     480
ttaatgatta tgttgagaaa ggcacccagg gtaagatcgt tgacctagtt aaagaattag     540
atcgtgatac cgtcttcgca ctagttaact atatttttttt caagggtaag tgggaacgtc     600
ctttcgaggt taaagatact gaagaggaag attttcatgt tgatcaagtt actactgtca     660
aagttccaat gatgaaaaga ctgggtatgt tcaatattca acattgcaaa aaattaagtt     720
cttgggtctt attaatgaag tatttaggta acgctactgc tatttttttt ttaccagacg     780
aaggtaagct tcaacattta gagaatgagt tgactcatga cattattact aaatttttag     840
agaacgagga tcgtcgtagc gcttctctgc acctgccaaa gttaagtatc accggtactt     900
acgacttaaa atctgtttta ggccagttag gtattaccaa agtttttttct aacggtgccg     960
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atttgagtgg tgttactgaa gaagctccat taaaattgag taaagctgtt cacaaagccg 1020
tcttaactat tgatgaaaag ggtaccgagg ccgccggcgc tatgttcctg gaagctattc 1080
caatgagcat tccaccagaa gttaaattta ataaaccatt cgtttttctg atgatcgagc 1140
agaacactaa aagcccattg tttatgggta aggttgtcaa cccaactcag aagatgtccg 1200
gaaagtcttt caaggccggt gtttgtccac caaagaagtc cgctcaatgt ttgagataca 1260
agaagccaga atgtcaatcc gactggcaat gtccaggtaa gaagagatgt tgtccagaca 1320
cttgtggtat caagtgtcta gacccagttg acaccccaaa cccaactaga agaaagccag 1380
gtaagtgtcc agttacttac ggtcaatgtt tgatgttgaa cccaccaaac ttctgtgaaa 1440
tggacggtca atgtaagaga gacttgaagt gttgtatggg tatgtgtggt aagtcctgtg 1500
tttccccagt caaggcctag tcgac 1525

<210> 16
<211> 503
<212> PRT
<213> Homo sapiens

<400> 16
Met Glu Asp Pro Gln Gly Asp Ala Ala Gln Lys Thr Asp Thr Ser His
1 5 10 15
His Asp Gln Asp His Pro Thr Phe Asn Lys Ile Thr Pro Asn Leu Ala
20 25 30
Glu Phe Ala Phe Ser Leu Tyr Arg Gln Leu Ala His Gln Ser Asn Ser
35 40 45
Thr Asn Ile Phe Phe Ser Pro Val Ser Ile Ala Thr Ala Phe Ala Met
50 55 60
Leu Ser Leu Gly Thr Lys Ala Asp Thr His Asp Glu Ile Leu Glu Gly
65 70 75 80
Leu Asn Phe Asn Leu Thr Glu Ile Pro Glu Ala Gln Ile His Glu Gly
85 90 95
Phe Gln Glu Leu Leu Arg Thr Leu Asn Gln Pro Asp Ser Gln Leu Gln
100 105 110
Leu Thr Thr Gly Asn Gly Leu Phe Leu Ser Glu Gly Leu Lys Leu Val
115 120 125
Asp Lys Phe Leu Glu Asp Val Lys Lys Leu Tyr His Ser Glu Ala Phe
130 135 140
Thr Val Asn Phe Gly Asp Thr Glu Glu Ala Lys Lys Gln Ile Asn Asp
145 150 155 160
Tyr Val Glu Lys Gly Thr Gln Gly Lys Ile Val Asp Leu Val Lys Glu
165 170 175
Leu Asp Arg Asp Thr Val Phe Ala Leu Val Asn Tyr Ile Phe Phe Lys
180 185 190
Gly Lys Trp Glu Arg Pro Phe Glu Val Lys Asp Thr Glu Glu Glu Asp
195 200 205
Phe His Val Asp Gln Val Thr Thr Val Lys Val Pro Met Met Lys Arg
210 215 220
Leu Gly Met Phe Asn Ile Gln His Cys Lys Lys Leu Ser Ser Trp Val
225 230 235 240
Leu Leu Met Lys Tyr Leu Gly Asn Ala Thr Ala Ile Phe Phe Leu Pro
245 250 255
Asp Glu Gly Lys Leu Gln His Leu Glu Asn Glu Leu Thr His Asp Ile
260 265 270
Ile Thr Lys Phe Leu Glu Asn Glu Asp Arg Arg Ser Ala Ser Leu His
275 280 285
Leu Pro Lys Leu Ser Ile Thr Gly Thr Tyr Asp Leu Lys Ser Val Leu
290 295 300
Gly Gln Leu Gly Ile Thr Lys Val Phe Ser Asn Gly Ala Asp Leu Ser
305 310 315 320

```
Gly Val Thr Glu Glu Ala Pro Leu Lys Leu Ser Lys Ala Val His Lys
                325                 330                 335
Ala Val Leu Thr Ile Asp Glu Lys Gly Thr Glu Ala Ala Gly Ala Met
            340                 345                 350
Phe Leu Glu Ala Ile Pro Met Ser Ile Pro Pro Glu Val Lys Phe Asn
        355                 360                 365
Lys Pro Phe Val Phe Leu Met Ile Glu Gln Asn Thr Lys Ser Pro Leu
    370                 375                 380
Phe Met Gly Lys Val Val Asn Pro Thr Gln Lys Met Ser Gly Lys Ser
385                 390                 395                 400
Phe Lys Ala Gly Val Cys Pro Pro Lys Lys Ser Ala Gln Cys Leu Arg
                405                 410                 415
Tyr Lys Lys Pro Glu Cys Gln Ser Asp Trp Gln Cys Pro Gly Lys Lys
            420                 425                 430
Arg Cys Cys Pro Asp Thr Cys Gly Ile Lys Cys Leu Asp Pro Val Asp
        435                 440                 445
Thr Pro Asn Pro Thr Arg Arg Lys Pro Gly Lys Cys Pro Val Thr Tyr
    450                 455                 460
Gly Gln Cys Leu Met Leu Asn Pro Pro Asn Phe Cys Glu Met Asp Gly
465                 470                 475                 480
Gln Cys Lys Arg Asp Leu Lys Cys Cys Met Gly Met Cys Gly Lys Ser
                485                 490                 495
Cys Val Ser Pro Val Lys Ala
            500
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<210> 17
<211> 1756
<212> DNA
<213> Homo sapiens

<400> 17

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tctagaccat ggaagaccct caaggcgacg ccgctcaaaa aaccgacacc agtcatcacg      60
accaagacca tccgactttt aataaaatta ctccaaattt agccgaattt gctttttctt     120
tgtatagaca attagctcat caaagtaatt ctactaacat ttttttttagt cctgtttcta     180
ttgccactgc tttcgccatg ttgagtttag gtactaaagc cgatacccat gacgagattt     240
tagaaggttt aaactttaat ttgaccgaaa tcccagaagc ccaaattcac gagggttttc     300
aagagttgtt gagaactttg aatcaacctg attctcaatt gcaattaact actggtaacg     360
gtttatttt gtctgaaggt ttaaaattgg ttgacaaatt cctagaagac gtcaagaaac     420
tatatcatag tgaggctttt accgttaatt ttggtgatac tgaggaagct aaaaagcaaa     480
ttaatgatta tgttgagaaa ggcacccagg gtaagatcgt tgacctagtt aaagaattag     540
atcgtgatac cgtcttcgca ctagttaact atatttttt caagggtaag tgggaacgtc     600
ctttcgaggt taaagatact gaagaggaag attttcatgt tgatcaagtt actactgtca     660
aagttccaat gatgaaaaga ctgggtatgt tcaatattca acattgcaaa aaattaagtt     720
cttgggtctt attaatgaag tatttaggta acgctactgc tatttttttt ttaccagacg     780
aaggtaagct tcaacattta gagaatgagt tgactcatga cattattact aaatttttag     840
agaacgagga tcgtcgtagc gcttctctgc acctgccaaa gttaagtatc accggtactt     900
acgacttaaa atctgtttta ggccagttag gtattaccaa agtttttttct aacggtgccg     960
atttgagtgg tgttactgaa gaagctccat taaaattgag taaagctgtt cacaaagccg    1020
tcttaactat tgatgaaaag ggtaccgagg ccgccggcgc tatgttcctg gaagctattc    1080
caatgagcat tccaccagaa gttaaattta ataaaccatt cgtttttctg atgatcgagc    1140
agaacactaa aagcccattg tttatgggta aggttgtcaa cccaactcag aagatgtgca    1200
cgtgtgtccc accccaccca cagacggcct tctgcaattc cgacctcgtc atcagggcca    1260
agttcgtggg gacaccagaa gtcaaccaga ccaccttata ccagcgttat gagatcaaga    1320
tgaccaagat gtataaaggg ttccaagcct taggggatgc cgctgacatc cggttcgtct    1380
acacccccgc catggagagt gtctgcggat acttccacag gtcccacaac cgcagcgagg    1440
agtttctcat tgctggaaaa ctgcaggatg gactcttgca catcactacc tgcagtttcg    1500
tggctccctg gaacagcctg agcttagctc agcgccgggg cttcaccaag acctacactg    1560
```

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ttggctgtga ggaatgcaca gtgtttccct gtttatccat cccctgcaaa ctgcagagtg    1620
gcactcattg cttgtggacg gaccagctcc tccaaggctc tgaaaagggc ttccagtccc    1680
gtcaccttgc ctgcctgcct cgggagccag ggctgtgcac ctggcagtcc ctgcggtccc    1740
agatagccta gtcgac                                                    1756

<210> 18
<211> 580
<212> PRT
<213> Homo sapiens

<400> 18
Met Glu Asp Pro Gln Gly Asp Ala Ala Gln Lys Thr Asp Thr Ser His
 1               5                  10                  15
His Asp Gln Asp His Pro Thr Phe Asn Lys Ile Thr Pro Asn Leu Ala
            20                  25                  30
Glu Phe Ala Phe Ser Leu Tyr Arg Gln Leu Ala His Gln Ser Asn Ser
        35                  40                  45
Thr Asn Ile Phe Phe Ser Pro Val Ser Ile Ala Thr Ala Phe Ala Met
    50                  55                  60
Leu Ser Leu Gly Thr Lys Ala Asp Thr His Asp Glu Ile Leu Glu Gly
65                  70                  75                  80
Leu Asn Phe Asn Leu Thr Glu Ile Pro Glu Ala Gln Ile His Glu Gly
                85                  90                  95
Phe Gln Glu Leu Leu Arg Thr Leu Asn Gln Pro Asp Ser Gln Leu Gln
            100                 105                 110
Leu Thr Thr Gly Asn Gly Leu Phe Leu Ser Glu Gly Leu Lys Leu Val
        115                 120                 125
Asp Lys Phe Leu Glu Asp Val Lys Lys Leu Tyr His Ser Glu Ala Phe
    130                 135                 140
Thr Val Asn Phe Gly Asp Thr Glu Glu Ala Lys Lys Gln Ile Asn Asp
145                 150                 155                 160
Tyr Val Glu Lys Gly Thr Gln Gly Lys Ile Val Asp Leu Val Lys Glu
                165                 170                 175
Leu Asp Arg Asp Thr Val Phe Ala Leu Val Asn Tyr Ile Phe Phe Lys
            180                 185                 190
Gly Lys Trp Glu Arg Pro Phe Glu Val Lys Asp Thr Glu Glu Glu Asp
        195                 200                 205
Phe His Val Asp Gln Val Thr Thr Val Lys Val Pro Met Met Lys Arg
    210                 215                 220
Leu Gly Met Phe Asn Ile Gln His Cys Lys Lys Leu Ser Ser Trp Val
225                 230                 235                 240
Leu Leu Met Lys Tyr Leu Gly Asn Ala Thr Ala Ile Phe Phe Leu Pro
                245                 250                 255
Asp Glu Gly Lys Leu Gln His Leu Glu Asn Glu Leu Thr His Asp Ile
            260                 265                 270
Ile Thr Lys Phe Leu Glu Asn Glu Asp Arg Arg Ser Ala Ser Leu His
        275                 280                 285
Leu Pro Lys Leu Ser Ile Thr Gly Thr Tyr Asp Leu Lys Ser Val Leu
    290                 295                 300
Gly Gln Leu Gly Ile Thr Lys Val Phe Ser Asn Gly Ala Asp Leu Ser
305                 310                 315                 320
Gly Val Thr Glu Glu Ala Pro Leu Lys Leu Ser Lys Ala Val His Lys
                325                 330                 335
Ala Val Leu Thr Ile Asp Glu Lys Gly Thr Glu Ala Ala Gly Ala Met
            340                 345                 350
Phe Leu Glu Ala Ile Pro Met Ser Ile Pro Pro Glu Val Lys Phe Asn
        355                 360                 365
```

```
Lys Pro Phe Val Phe Leu Met Ile Glu Gln Asn Thr Lys Ser Pro Leu
    370                 375                 380
Phe Met Gly Lys Val Val Asn Pro Thr Gln Lys Met Cys Thr Cys Val
385                 390                 395                 400
Pro Pro His Pro Gln Thr Ala Phe Cys Asn Ser Asp Leu Val Ile Arg
                405                 410                 415
Ala Lys Phe Val Gly Thr Pro Glu Val Asn Gln Thr Thr Leu Tyr Gln
            420                 425                 430
Arg Tyr Glu Ile Lys Met Thr Lys Met Tyr Lys Gly Phe Gln Ala Leu
        435                 440                 445
Gly Asp Ala Ala Asp Ile Arg Phe Val Tyr Thr Pro Ala Met Glu Ser
    450                 455                 460
Val Cys Gly Tyr Phe His Arg Ser His Asn Arg Ser Glu Glu Phe Leu
465                 470                 475                 480
Ile Ala Gly Lys Leu Gln Asp Gly Leu Leu His Ile Thr Thr Cys Ser
                485                 490                 495
Phe Val Ala Pro Trp Asn Ser Leu Ser Leu Ala Gln Arg Arg Gly Phe
            500                 505                 510
Thr Lys Thr Tyr Thr Val Gly Cys Glu Glu Cys Thr Val Phe Pro Cys
        515                 520                 525
Leu Ser Ile Pro Cys Lys Leu Gln Ser Gly Thr His Cys Leu Trp Thr
    530                 535                 540
Asp Gln Leu Leu Gln Gly Ser Glu Lys Gly Phe Gln Ser Arg His Leu
545                 550                 555                 560
Ala Cys Leu Pro Arg Glu Pro Gly Leu Cys Thr Trp Gln Ser Leu Arg
                565                 570                 575
Ser Gln Ile Ala
            580
```

<210> 19
<211> 1582
<212> DNA
<213> Homo sapiens

<400> 19

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tctagaccat ggaagaccct caaggcgacg ccgctcaaaa aaccgacacc agtcatcacg      60
accaagacca tccgactttt aataaaatta ctccaaattt agccgaattt gctttttctt     120
tgtatagaca attagctcat caaagtaatt ctactaacat ttttttttagt cctgtttcta     180
ttgccactgc tttcgccatg ttgagtttag gtactaaagc cgatacccat gacgagattt     240
tagaaggttt aaactttaat ttgaccgaaa tcccagaagc ccaaattcac gagggttttc     300
aagagttgtt gagaactttg aatcaacctg attctcaatt gcaattaact actggtaacg     360
gtttattttt gtctgaaggt ttaaaattgg ttgacaaatt cctagaagac gtcaagaaac     420
tatatcatag tgaggctttt accgttaatt ttggtgatac tgaggaagct aaaaagcaaa     480
ttaatgatta tgttgagaaa ggcacccagg gtaagatcgt tgacctagtt aaagaattag     540
atcgtgatac cgtcttcgca ctagttaact atatttttt caagggtaag tgggaacgtc     600
ctttcgaggt taaagatact gaagaggaag attttcatgt tgatcaagtt actactgtca     660
aagttccaat gatgaaaaga ctgggtatgt tcaatattca acattgcaaa aaattaagtt     720
cttgggtctt attaatgaag tatttaggta acgctactgc tatttttttt ttaccagacg     780
aaggtaagct tcaacattta gagaatgagt tgactcatga cattattact aaatttttag     840
agaacgagga tcgtcgtagc gcttctctgc acctgccaaa gttaagtatc accggtactt     900
acgacttaaa atctgtttta ggccagttag gtattaccaa agtttttttct aacggtgccg     960
atttgagtgg tgttactgaa gaagctccat taaaattgag taaagctgtt cacaaagccg    1020
tcttaactat tgatgaaaag ggtaccgagg ccgccggcgc tatgttcctg gaagctattc    1080
caatgagcat tccaccagaa gttaaattta ataaaccatt cgtttttctg atgatcgagc    1140
agaacactaa aagcccattg tttatgggta aggttgtcaa cccaactcag aagatgtgca    1200
cgtgtgtccc accccaccca cagacggcct tctgcaattc cgacctcgtc atcagggcca    1260
agttcgtggg gacaccagaa gtcaaccaga ccaccttata ccagcgttat gagatcaaga    1320
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tgaccaagat gtataaaggg ttccaagcct taggggatgc cgctgacatc cggttcgtct 1380
acacccccgc catggagagt gtctgcggat acttccacag gtcccacaac cgcagcgagg 1440
agtttctcat tgctggaaaa ctgcaggatg gactcttgca catcactacc tgcagtttcg 1500
tggctccctg gaacagcctg agcttagctc agcgccgggg cttcaccaag acctacactg 1560
ttggctgtga ggaatagtcg ac 1582

<210> 20
<211> 522
<212> PRT
<213> Homo sapiens

<400> 20
Met Glu Asp Pro Gln Gly Asp Ala Ala Gln Lys Thr Asp Thr Ser His
1 5 10 15
His Asp Gln Asp His Pro Thr Phe Asn Lys Ile Thr Pro Asn Leu Ala
20 25 30
Glu Phe Ala Phe Ser Leu Tyr Arg Gln Leu Ala His Gln Ser Asn Ser
35 40 45
Thr Asn Ile Phe Phe Ser Pro Val Ser Ile Ala Thr Ala Phe Ala Met
50 55 60
Leu Ser Leu Gly Thr Lys Ala Asp Thr His Asp Glu Ile Leu Glu Gly
65 70 75 80
Leu Asn Phe Asn Leu Thr Glu Ile Pro Glu Ala Gln Ile His Glu Gly
85 90 95
Phe Gln Glu Leu Leu Arg Thr Leu Asn Gln Pro Asp Ser Gln Leu Gln
100 105 110
Leu Thr Thr Gly Asn Gly Leu Phe Leu Ser Glu Gly Leu Lys Leu Val
115 120 125
Asp Lys Phe Leu Glu Asp Val Lys Lys Leu Tyr His Ser Glu Ala Phe
130 135 140
Thr Val Asn Phe Gly Asp Thr Glu Glu Ala Lys Lys Gln Ile Asn Asp
145 150 155 160
Tyr Val Glu Lys Gly Thr Gln Gly Lys Ile Val Asp Leu Val Lys Glu
165 170 175
Leu Asp Arg Asp Thr Val Phe Ala Leu Val Asn Tyr Ile Phe Phe Lys
180 185 190
Gly Lys Trp Glu Arg Pro Phe Glu Val Lys Asp Thr Glu Glu Glu Asp
195 200 205
Phe His Val Asp Gln Val Thr Thr Val Lys Val Pro Met Met Lys Arg
210 215 220
Leu Gly Met Phe Asn Ile Gln His Cys Lys Lys Leu Ser Ser Trp Val
225 230 235 240
Leu Leu Met Lys Tyr Leu Gly Asn Ala Thr Ala Ile Phe Phe Leu Pro
245 250 255
Asp Glu Gly Lys Leu Gln His Leu Glu Asn Glu Leu Thr His Asp Ile
260 265 270
Ile Thr Lys Phe Leu Glu Asn Glu Asp Arg Arg Ser Ala Ser Leu His
275 280 285
Leu Pro Lys Leu Ser Ile Thr Gly Thr Tyr Asp Leu Lys Ser Val Leu
290 295 300
Gly Gln Leu Gly Ile Thr Lys Val Phe Ser Asn Gly Ala Asp Leu Ser
305 310 315 320
Gly Val Thr Glu Glu Ala Pro Leu Lys Leu Ser Lys Ala Val His Lys
325 330 335
Ala Val Leu Thr Ile Asp Glu Lys Gly Thr Glu Ala Ala Gly Ala Met
340 345 350
Phe Leu Glu Ala Ile Pro Met Ser Ile Pro Pro Glu Val Lys Phe Asn

```
        355                 360                 365
Lys Pro Phe Val Phe Leu Met Ile Glu Gln Asn Thr Lys Ser Pro Leu
    370                 375                 380
Phe Met Gly Lys Val Val Asn Pro Thr Gln Lys Met Cys Thr Cys Val
385                 390                 395                 400
Pro Pro His Pro Gln Thr Ala Phe Cys Asn Ser Asp Leu Val Ile Arg
                405                 410                 415
Ala Lys Phe Val Gly Thr Pro Glu Val Asn Gln Thr Thr Leu Tyr Gln
            420                 425                 430
Arg Tyr Glu Ile Lys Met Thr Lys Met Tyr Lys Gly Phe Gln Ala Leu
        435                 440                 445
Gly Asp Ala Ala Asp Ile Arg Phe Val Tyr Thr Pro Ala Met Glu Ser
    450                 455                 460
Val Cys Gly Tyr Phe His Arg Ser His Asn Arg Ser Glu Glu Phe Leu
465                 470                 475                 480
Ile Ala Gly Lys Leu Gln Asp Gly Leu Leu His Ile Thr Thr Cys Ser
                485                 490                 495
Phe Val Ala Pro Trp Asn Ser Leu Ser Leu Ala Gln Arg Arg Gly Phe
            500                 505                 510
Thr Lys Thr Tyr Thr Val Gly Cys Glu Glu
        515                 520
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<210> 21
<211> 397
<212> DNA
<213> Homo sapiens

<400> 21

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tctagaccat gtgcacctgt gtcccacccc acccacagac ggccttctgc aattccgacc      60
tcgtcatcag ggccaagttc gtggggacac cagaagtcaa ccagaccacc ttataccagc     120
gttatgagat caagatgacc aagatgtata aagggttcca agccttaggg gatgccgctg     180
acatccggtt cgtctacacc cccgccatgg agagtgtctg cggatacttc cacaggtccc     240
acaaccgcag cgaggagttt ctcattgctg gaaaactgca ggatggactc ttgcacatca     300
ctacctgcag tttcgtggct ccctggaaca gcctgagctt agctcagcgc cggggcttca     360
ccaagacgta tactgttggc tgtgaggaat agtcgac                              397
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<210> 22
<211> 127
<212> PRT
<213> Homo sapiens

<400> 22

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Met Cys Thr Cys Val Pro Pro His Pro Gln Thr Ala Phe Cys Asn Ser
 1               5                  10                  15
Asp Leu Val Ile Arg Ala Lys Phe Val Gly Thr Pro Glu Val Asn Gln
            20                  25                  30
Thr Thr Leu Tyr Gln Arg Tyr Glu Ile Lys Met Thr Lys Met Tyr Lys
        35                  40                  45
Gly Phe Gln Ala Leu Gly Asp Ala Ala Asp Ile Arg Phe Val Tyr Thr
    50                  55                  60
Pro Ala Met Glu Ser Val Cys Gly Tyr Phe His Arg Ser His Asn Arg
65                  70                  75                  80
Ser Glu Glu Phe Leu Ile Ala Gly Lys Leu Gln Asp Gly Leu Leu His
                85                  90                  95
Ile Thr Thr Cys Ser Phe Val Ala Pro Trp Asn Ser Leu Ser Leu Ala
            100                 105                 110
Gln Arg Arg Gly Phe Thr Lys Thr Tyr Thr Val Gly Cys Glu Glu
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115 120 125

<210> 23
<211> 400
<212> DNA
<213> Homo sapiens

<400> 23
tctagaccat gtgcacctgt gtcccacccc acccacagac ggccttctgc aattccgacc 60
tcgtcatcag ggccaagttc gtggggacac cagaagtcaa ccagaccacc ttataccagc 120
gttatgagat caagatgacc aagatgtata aagggttcca agccttaggg gatgccgctg 180
acatccggtt cgtctacacc cccgccatgg agagtgtctg cggatacttc cacaggtccc 240
acaaccgcag cgaggagttt ctcattgctg gaaaactgca ggatggactc ttgcacatca 300
ctacctgcag tttcgtggct ccctggaaca gcctgagctt agctcagcgc cggggcttca 360
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35 40 45
Gly Phe Gln Ala Leu Gly Asp Ala Ala Asp Ile Arg Phe Val Tyr Thr
50 55 60
Pro Ala Met Glu Ser Val Cys Gly Tyr Phe His Arg Ser His Asn Arg
65 70 75 80
Ser Glu Glu Phe Leu Ile Ala Gly Lys Leu Gln Asp Gly Leu Leu His
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tactcagatt tagaagggga tttcgatgtt gctgttttgc cattttccaa cagcacaaat 180
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Ile Pro Ala Glu Ala Val Ile Gly Tyr Ser Asp Leu Glu Gly Asp Phe
        35   40   45
Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu
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